1. (currently amended) In a communications receiver having a ~~decision~~-feedback equalizer filter including filter coefficients, said communications receiver responsive to a received signal, said communications receiver further having an input filter responsive to said received signal to form soft decision samples corresponding to said received signal, and a slicer responsive to said received signal to form hard decision samples corresponding to said received signal, said soft decision samples and said hard decision samples comprising a series of individual signal samples, a method for operating said ~~decision~~-feedback equalizer filter comprising:

operating said ~~decision~~-feedback equalizer filter in a first mode by coupling said soft decision samples to said ~~decision~~-feedback equalizer filter;

operating said ~~decision~~-feedback equalizer filter in a second mode by coupling said hard decision samples to said ~~decision~~-feedback equalizer filter;

operating said ~~decision~~-feedback equalizer filter in said first mode during a signal acquisition period;

operating said ~~decision~~-feedback equalizer filter in said second mode during a signal tracking period;

switching from said second mode to said first mode responsive to a first individual signal sample; and

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switching back from said first mode to said second mode responsive to a second individual signal sample,

whereby said ~~decision~~-feedback equalizer filter is switched between said first and second modes on an individual sample by sample basis.

2. (currently amended) A method in accordance with claim 1, wherein ~~said~~ the steps of switching <u>from said second mode to said first mode and switching back from said first mode to said second mode</u> ~~between first and second modes~~ on ~~an~~ the individual sample by sample basis comprise switching between said first and second modes in accordance with the quality of said first and second individual signal samples, said steps comprising:

measuring the quality level of said first individual signal sample;

measuring the quality level of said second individual signal sample;

coupling an individual one of said soft decision samples to said ~~decision~~-feedback equalizer filter when said quality of said first individual signal sample is at a first quality level; and

coupling an individual one of said hard decision samples to said ~~decision~~ feedback

equalizer filter when said quality of said second individual signal sample is at a second

quality level,

wherein said second quality level is greater than said first quality level.

3. (currently amended) A method in accordance with claim 2, wherein said signal

samples are represented as constellation points in a complex plane, and wherein said first

individual signal sample is at ~~a~~ said first quality level when outside of a square region of

said complex plane forming a box of width w, said square region of said complex plane

~~box of width w~~ being centered about the origin of said complex plane, and said second

individual signal sample is at ~~a~~ said second quality level when inside said square region

of said complex plane ~~box of width w, centered about the origin of said complex plane~~.

4. (currently amended) A method in accordance with claim 2, wherein said signal

samples are represented as constellation points in a complex plane, wherein said method

includes calculating the least means squares error of said second individual sample, and

wherein said first individual signal sample is at ~~a~~ said first quality level when outside of a

square region of said complex plane forming a box of width w, said square region of said

complex plane ~~box of width w~~ being centered about the origin of said complex plane, and

said second individual signal sample is at ~~a~~ said second quality level when inside said

square region of said complex plane ~~box of width w, centered about the origin of said~~

complex plane and the least means squares error of said second individual signal sample is below less than a predetermined threshold level t.

5. (currently amended) A method in accordance with claim 4, wherein said predetermined threshold level t is represented as a reliability area comprising a region of said complex plane forming a circle in said complex plane centered on said second constellation point in said complex plane representing said second individual signal sample.

6. (currently amended) A method in accordance with claim 4, wherein said predetermined threshold level t is represented as a reliability area comprising a region of said complex plane forming a box centered on the constellation point in said complex plane representing said second individual signal sample in said complex plane.

7. (currently amended) A method in accordance with claim 3, further including evaluating a number of past signal samples from said series of individual signal samples forming a block of past signal samples wherein the width w of said box region of said complex plane is adaptive based on selected responsive to the qualities of a said block of past signal samples.

8. (currently amended) A method in accordance with claim 4, further including evaluating a number of past signal samples from said series of individual signal samples forming a block of past signal samples wherein said threshold t is adaptive based on selected responsive to the qualities of a said block of past signal samples.

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9. (currently amended) A method in accordance with claim 1, wherein said method includes calculating the constant modulus algorithm, and wherein said first mode is a signal acquisition mode using said soft decision samples and the said constant modulus algorithm to update said filter coefficients of said feedback equalizer filter.

10. (currently amended) A method in accordance with claim 1, wherein said method includes calculating the least means squares error of said second individual sample, and wherein said second mode is a signal tracking mode using said hard decision samples and the said least means squared error algorithm to update said filter coefficients of said feedback equalizer filter.

11. (currently amended) In a communications receiver having a decision feedback equalizer filter including filter coefficients, said communications receiver responsive to a received signal, said communications receiver further having an input filter responsive to said received signal to form soft decision samples corresponding to said received signal, and a slicer responsive to said received signal to form hard decision samples corresponding to said received signal, said soft decision samples and said hard decision samples comprising a series of individual signal samples, a decision feedback equalizer filter arrangement comprising:

a first switch operable in a first mode, to couple said decision feedback equalizer filter to said soft decision samples during a signal acquisition period, said first switch further

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operable in a second mode, to couple said ~~decision~~-feedback equalizer filter to said hard decision samples during a signal tracking period; and

a switch control responsive to a first individual signal sample to operate said ~~first~~-switch from said second mode to said first mode, and responsive to a second individual signal sample to operate said ~~first~~-switch from said first mode to said second mode,

whereby said ~~decision~~-feedback equalizer filter is switched between said first and second modes on an individual sample by sample basis.

12. (currently amended) A ~~communications receiver~~decision feedback equalizer arrangement in accordance with claim 11, wherein said ~~decision~~-feedback equalizer filter is operated in said first and second modes in accordance with the quality of said first and second individual signal samples, said ~~decision~~-feedback equalizer filter ~~mode~~-being operated in said first mode by said switch control when said quality of said first individual signal sample is at a first quality level, said ~~decision~~-feedback equalizer filter ~~mode~~-being operated in said second mode by said switch control when said quality of said second individual signal sample is at a second quality level, wherein said second quality level is greater than said first quality level.

13. (currently amended) A ~~communications receiver~~decision feedback equalizer arrangement in accordance with claim 12, wherein said signal samples are represented as constellation points in a complex plane, and wherein said first individual signal sample is

at ~~a~~ said first quality level when outside of a square region of said complex plane forming a box of width w, said square region of said complex plane ~~box of width w~~ being centered about the origin of said complex plane, and said second individual signal sample is at a said second quality level when inside said square region of said complex plane ~~box of width w, centered about the origin of said complex plane~~.

14. (currently amended) A ~~communications receiver~~ decision feedback equalizer arrangement in accordance with claim 12, wherein said decision feedback equalizer arrangement further includes means for calculating the least means squares error of said second individual sample wherein said signal samples are represented as constellation points in a complex plane, and wherein said first individual signal sample is at ~~a~~ said first quality level when outside of a square region of said complex plane forming a box of width w, square region of said complex plane ~~said box of width w~~ being centered about the origin of said complex plane, and said second individual signal sample is at ~~a~~ said second quality level when inside said square region of said complex plane ~~box of width w, centered about the origin of said complex plane~~ and the least means squares error of said second individual signal sample is ~~below~~ less than a predetermined threshold level t.

15. (currently amended) A decision feedback equalizer arrangement ~~communications receiver~~ in accordance with claim 14, wherein said predetermined threshold level t is represented as a reliability area forming a region of said complex plane comprising a circle centered on said second constellation point in said complex plane representing said second individual signal sample ~~in said complex plane~~.

16. (currently amended) A <u>decision feedback equalizer arrangement</u> ~~communications receiver~~ in accordance with claim 14, wherein said <u>predetermined</u> threshold <u>level</u> t is represented as a reliability area comprising <u>a region of said complex plane forming a box centered on the constellation point in said complex plane representing said second individual signal sample</u> ~~in said complex plane~~.

17. (currently amended) A <u>decision feedback equalizer arrangement</u> ~~communications receiver~~ in accordance with claim 13, <u>further including evaluating a number of past signal samples from said series of individual signal samples forming a block of past signal samples</u> wherein the width w of said <u>region of said complex plane</u> ~~box~~ is <u>selected responsive to</u> ~~adaptive based on~~ the qualities of a block of past signal samples.

18. (currently amended) A <u>decision feedback equalizer arrangement</u> ~~communications receiver~~ in accordance with claim 14, <u>further including means for evaluating a number of past signal samples from said series of individual signal samples forming a block of past signal samples</u> wherein said threshold t is ~~adaptive based on~~ <u>selected responsive to</u> the qualities of ~~a~~ <u>said</u> block of past signal samples.

19. (currently amended) A <u>decision feedback equalizer arrangement</u> ~~communications receiver~~ in accordance with claim 11, <u>further including means for calculating the constant modulus algorithm, and</u> wherein said first mode is a signal acquisition mode using said

soft decision samples and the said constant modulus algorithm to update said filter coefficients of said feedback equalizer filter.

20. (currently amended) A decision feedback equalizer arrangement communications receiver in accordance with claim 11, further including calculating the least means squares error of said second individual sample, wherein said second mode is a signal tracking mode using said hard decision samples and the said least means squared algorithm error to update said filter coefficients of said feedback equalizer filter.

21. (currently amended) In a communications receiver having a decision feedback equalizer filter including filter coefficients, said communications receiver responsive to a received signal, said communications receiver further having an input filter responsive to said received signal to form soft decision samples corresponding to said received signal, and a slicer responsive to said received signal to form hard decision samples corresponding to said received signal, said soft decision samples and said hard decision samples comprising a series of individual signal samples, an apparatus for operating said decision-feedback equalizer filter comprising:

means for operating said decision-feedback equalizer filter in a first mode by coupling said soft decision samples to said decision-feedback equalizer filter;

means for operating said decision-feedback equalizer filter in a second mode by coupling said hard decision samples to said decision-feedback equalizer filter;

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means for operating said ~~decision~~ feedback equalizer filter in said first mode during a signal acquisition period;

means for operating said ~~decision~~ feedback equalizer filter in said second mode during a signal tracking period;

means for switching from said second mode to said first mode responsive to a first individual signal sample; and

means for switching back from said first mode to said second mode responsive to a second individual signal sample,

whereby said ~~decision~~ feedback equalizer filter is switched between said first and second modes on an individual sample by sample basis.

22. (currently amended) ~~A communications receiver~~ An apparatus in accordance with claim 21, wherein said soft decision samples are stored in said ~~decision~~ feedback equalizer filter in said first mode and used to adapt said filter coefficients of said ~~decision~~ feedback equalizer filter using a first adaptation algorithm.

23. (currently amended) ~~A communications receiver~~ An apparatus in accordance with claim 22, wherein said first adaptation algorithm is a Constant Modulus Algorithm.

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24. (currently amended) An apparatus~~A communications receiver~~ in accordance with claim 22, wherein said first adaptation algorithm is a Least Mean Squares Algorithm.

25. (currently amended) An apparatus~~A communications receiver~~ in accordance with claim 21, wherein said hard decision samples are stored in said ~~decision~~ feedback equalizer filter in said second mode and used to adapt said filter coefficients of said ~~decision~~ feedback equalizer filter using a second adaptation algorithm.

26. (currently amended) An apparatus~~A communications receiver~~ in accordance with claim 25, wherein said second adaptation algorithm is a Constant Modulus Algorithm.

27. (currently amended) An apparatus~~A communications receiver~~ in accordance with claim 25, wherein said second adaptation algorithm is a Least Mean Squares Algorithm.

28. (currently amended) An apparatus~~A communications receiver~~ in accordance with claim 21, wherein,

said soft decision samples are stored in said ~~decision~~ feedback equalizer filter in said first mode and used to adapt said filter coefficients of said ~~decision~~ feedback equalizer filter using a first adaptation algorithm;

said hard decision samples are stored in said ~~decision~~ feedback equalizer filter in said

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second mode and used to adapt said filter coefficients of said ~~decision~~ feedback equalizer filter using a second adaptation algorithm; and

said first adaptation algorithm is a Constant Modulus Algorithm, and said second adaptation algorithm is a Least Mean Squares Algorithm.

29. (currently amended) A method in accordance with claim 1, wherein said soft decision samples are stored in said ~~decision~~ feedback equalizer filter in said first mode and used to adapt said filter coefficients of said ~~decision~~ feedback equalizer filter using a first adaptation algorithm.

30. (original) A method in accordance with claim 29, wherein said first adaptation algorithm is a Constant Modulus Algorithm.

31. (original) A method in accordance with claim 29, wherein said first adaptation algorithm is a Least Mean Squares Algorithm.

32. (currently amended) A method in accordance with claim 1, wherein said hard decision samples are stored in said ~~decision~~ feedback equalizer filter in said second mode and used to adapt said filter coefficients of said ~~decision~~ feedback equalizer filter using a second adaptation algorithm.

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33. (original) A method in accordance with claim 32, wherein said second adaptation

algorithm is a Constant Modulus Algorithm.

34. (original) A method in accordance with claim 32, wherein said second adaptation

algorithm is a Least Mean Squares Algorithm.

35. (currently amended) A method in accordance with claim 1, wherein,

said soft decision samples are stored in said decision-feedback equalizer filter in said

first mode and used to adapt said filter coefficients of said decision-feedback equalizer

filter using a first adaptation algorithm;

said hard decision samples are stored in said decision-feedback equalizer filter in said

second mode and used to adapt said filter coefficients of said decision-feedback equalizer

filter using a second adaptation algorithm; and

said first adaptation algorithm is a Constant Modulus Algorithm, and said second

adaptation algorithm is a Least Mean Squares Algorithm.

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